

In the Drawings

Amend the Drawings as follows:

Substitute the attached page containing Fig. 1 for the page originally filed.

REMARKS

Applicant appreciates the thoroughness with which the Examiner has examined the above-identified application. Reconsideration is requested in view of the amendments above and the remarks below.

Restriction/Election

In response to the restriction requirement set forth by the Examiner between Group I apparatus claims 1-17 and Group II method claims 18-24, applicant elects claim Group II, method claims 18-24, with traverse. Applicant has cancelled the non-elected apparatus claims.

With regard to the species restriction set forth between the first species of Fig. 5, the second species of Fig. 7, the third species of Figs 6-7, with the modification of paragraph 0043, and the variants of Figs. 3 and 8, applicant provisionally elects the first species of Fig. 5 if no generic claim is held allowable. Of the remaining elected method claims, claims 18, 19, 21, 23-28, 33 and 34 are readable on the species of Fig. 5.

Drawings objection

Applicant encloses herewith a substitute drawing page containing Fig. 1 with the legend "PRIOR ART" as requested by the Examiner. An annotated page showing the change in red is also attached.

Rejection on basis of prior art

Claims 1, 2, 4-11, 15, 16 and 18-24 stand rejected under 35 USC § 102 as being anticipated by or, in the alternative, under 35 USC § 103 as being obvious from EP A 0

522 288. Claims 1, 2, 4-13, and 15-24 stand rejected under 35 USC § 103 as being obvious from EP '288 in view of applicant's admitted prior art Fig. 1.

Claims 3 and 14 stand rejected under 35 USC § 103 as being obvious from EP '288 and the Fig. 1 prior art, further in view of Hughes U.S. Patent No. 5,157,944.

Claims 4, 12 and 13 stand rejected under 35 USC § 103 as being obvious from EP '288 and the Fig. 1 prior art, further in view of Heine et al. U.S. Patent No. 5,657,817, Neufang U.S. Patent No. 6,615,604 or JP 11-264688.

Applicant respectfully traverses these rejections. Since applicant has elected the method claims, no comments will be made regarding the apparatus claims unless and until the Examiner withdraws the restriction requirement.

As for the method claims, applicant has cancelled dependent claims 20 and 22. Claim 18 has been amended to incorporate the subject matter of claim 22, and to clarify that the first and second manifolds extend across the first and second ends, respectively, of each second heat exchanger portion. Support is found in the specification at paragraph 0039 and in the drawings in Figs. 2-5, manifolds 34a, 34b, 34c, 34d.

Applicant has also added new claims 25-34. Claim 25, dependent on claim 18, recites the subject matter of cancelled claim 4. Independent claim 26 combines the subject matter of claims 18 as amended, 21 and 23, and also uses the terminology of "upper" and "lower" to describe the charge air cooler portions and to describe the "first" and "second" ends, respectively, of the radiator and charge air cooler portions. This is supported in the specification at paragraph 0039 and in the drawings in Figs. 2-5. Claim 27, dependent on claim 26, also recites the subject matter of claim 4. Claims 28-32,

dependent on claim 26, recite the subject matter of cancelled claims 6 and 11-14, respectively. Claims 33 and 34, dependent on claims 26 and 18, respectively, recite that the charge air or second fluid flow is around both sides of the charge air cooler or second heat exchanger. Support for this amendment is found in the specification at paragraph 0048 and in Fig. 9. No new matter has been added

EP '288, cited by the Examiner, discloses a radiator/charge air intercooler assembly in which the first intercooler 4 receiving the charge air is located behind the lower portion of the radiator, relative to the cooling air flow, and the second intercooler 3 receiving the partially cooled charge air is located in front of the upper portion of the radiator. While the arrows show a general direction of charge air flow downward for the lower, rear intercooler and upward for the upper, front intercooler, there is no disclosure of the locations or orientations of any manifolds for the intercooler. In other words, the manifolds are not disclosed as being horizontally oriented, at the upper and lower ends of the intercoolers, or vertically oriented, at the opposite sides of the intercoolers. Further, the inlet for the charge air at the upper end of the lower rear intercooler 4, adjacent the central portion of the radiator, and the connection between the intercoolers is shown as being between the bottom of the lower rear intercooler and the bottom of the upper front intercooler.

Claim 18

In contrast to the EP '288 reference, applicant's claim 18 describes a method of cooling engine fluids in which the heat exchanger assembly has first and second heat exchanger portions that have manifolds that extend across the ends thereof, where the

ends are oriented in the same direction as the first heat exchanger. The EP '288 reference does not disclose such manifolds for its intercoolers. Further, applicant's claim 18 recites that the second heat exchanger portions are operatively connected such that the second fluid may flow between the second manifold of the one of the second heat exchanger portion and the first manifold of the other of the second heat exchanger portions. Even if EP '288 suggested manifolds extending across the "ends" of the intercoolers in the same manner as in claim 18, the disclosed connection between the two would be between the "second manifolds" of each, and not between the second manifold of one and the first manifold of the other as recited in claim 18.

The combination of EP '288 and applicant's prior art Fig. 1 would also not suggest the method of claim 18 to one of ordinary skill in the art. Applicant's Fig. 1 shows the manifolds positioned not at the "ends" of the charge air cooler portions, but along the "sides," as defined in the claim. Given the lack of teaching in EP '288 concerning the location of the manifolds and the completely different manner of connection, the hypothetical combination would not result in applicant's claimed invention.

Claim 19 and 21

Claims 19 and 21, each dependent on claim 18, describe methods of cooling engine fluids using alternate (reverse) directions of flow of the flow of fluid through and between the second heat exchanger portions. Such fluid flow, which requires that the second fluid flow from the second manifold of the one of the second heat exchanger portions to the first manifold of the other of the second heat exchanger portions (claim 21)

or vice-versa (claim 19), is not suggested by the charge air flow shown between intercoolers 3 and 4 of EP '288, or by a combination of EP '288 and Fig. 1.

Claim 25

New claim 25, dependent on claim 18 and reciting the subject matter of claim 4, describes a method of cooling engine fluids wherein the dimension between the first and second ends of the second heat exchanger portions is less than the dimension from one side of the second heat exchanger portions to the other side of the second heat exchanger portions, and recites the use of the tubes extending across the shorter dimension of the faces of the second heat exchanger portions to carry the second fluid between the manifolds. Applicant's claimed method modifies the core style, e.g., the tube geometry, in a non-obvious manner to obtain the desired cooling properties of the claimed charge air cooler portions. As stated in the specification at paragraph 0041:

Improved heat exchanger package performance, and in particular, improved performance of the charge air cooler units, has been found by utilizing tubes 36 which are as short as possible and as numerous as possible, given the configuration of the charge air cooler unit.

As also mentioned in this paragraph, the core may be further modified by making the tubes two rows deep, or any other configuration. The cited prior art does not suggest this ability to modify core properties such as tube geometry. No such structure and fluid flow is shown or suggested by EP '288 or by the combination of EP '288 and Fig. 1. Likewise, Heine et al., Neufang and JP 11-264688 in combination with EP '288 and Fig. 1, cited against claim 4, do not disclose or suggest the use of the dimensional relationship of the tubes of claim 25.

Claim 26

Independent claim 26 specifies in the claimed method the use of the preferred radiator and charge air cooler portions, and the flow of charge air and cooling air through the structure. In particular, the upper charge air cooler portion is behind the radiator, and the lower charge air cooler portion is in front of the radiator, with respect to the flow of cooling air. This provides completely different flow pattern for the charge air with respect to the radiator. Instead of entering the lower charge air cooler near the center of the radiator, and flowing through some indeterminate manifold as in EP '288, the charge air in claim 26 enters through an upper manifold of the upper charge air cooler adjacent the upper end of the radiator. The transfer of charge air between the two charge air cooler portions is likewise different. In EP '288, the charge air flows from the lower end of the lower intercooler 4 to the lower end of the upper intercooler 3, whereas in claim 26 the charge air flows from the lower manifold of upper charge air cooler portion to the upper manifold of the lower charge air cooler portion.

Combining EP '288 and Fig. 1 would also not render obvious the invention of claim 26 since the use of side manifolds in Fig. 1 would result in a completely different charge air flow from that described in the claim.

Thus, EP '288 or the combination of EP '288 and Fig. 1 does not disclose or suggest applicant's method of claim 26.

Claim 27

Claim 27, dependent on claim 26, describes the same subject matter as claim 25 in that the dimension between the first and second ends of the second heat exchanger portions is less than the dimension from one side of the second heat exchanger portions to the other side of the second heat exchanger portions, and recites the use of the tubes extending across the shorter dimension of the faces of the second heat exchanger portions to carry the second fluid between the manifolds. Again, the ability to modify core properties such as the claimed tube geometry is not suggested by the cited prior art, and no such structure and fluid flow is suggested by the combination of EP '288, Fig. 1, Heine et al., Neufang and/or JP 11-264688.

Claim 28

Claim 28 adds to the method of claim 26 that the radiator tube extend in the same direction as the fluid-carrying tubes of the charge air cooler portions. Such similar tube direction is not disclosed in EP '288.

Claims 29-32

Claims 29-32, dependent on claim 26, specify in the method that one or more sides or ends of the radiator or charge air cooler extend beyond the other. These extensions are not disclosed or suggested in the cited prior art.

Claims 33 and 34

Claims 33 and 34, dependent on claims 26 and 18, respectively, recite in the claimed method that the charge air or second fluid flow is around both sides of the charge air cooler or second heat exchanger. Such charge air or fluid flow is not disclosed in the cited prior art.

It is respectfully submitted that the application has now been brought into a condition where allowance of the entire case is proper. Reconsideration and issuance of a notice of allowance are respectfully solicited.

Respectfully submitted,




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CERTIFICATE OF MAILING

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Name: Barbara Browne Date: August 24, 2005 Signature: 

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ANNOTATED SHEET

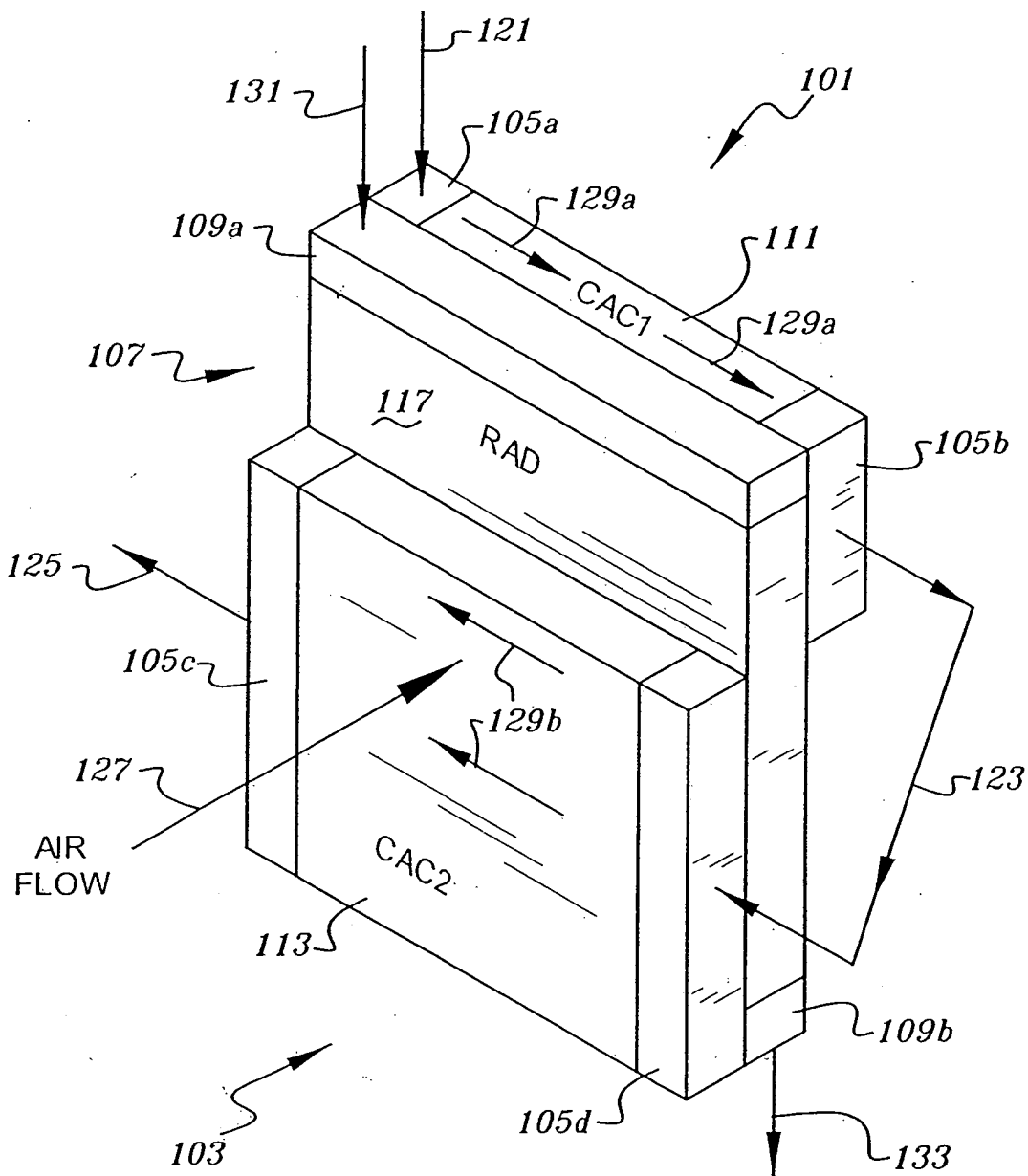


Fig. 1

PRIOR ART